

**STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF September 5, 2008

Prepared on June 6, 2008

ITEM:

SUBJECT: Revised Waste Discharge Requirements for the Paso Robles Class III Landfill, San Luis Obispo County—Waste Discharge Requirements Order No. R3-2008-0050

KEY INFORMATION

Location:	Nine miles east of the City of Paso Robles adjacent to Highway 46
Type of Waste:	Non-hazardous municipal solid wastes
Design Capacity:	6.5 million cubic yards of waste
Remaining Capacity:	5.3 million cubic yards (based on 75,000 tons per year of waste disposed); estimated closure date of 2051
Disposal:	Land based on fill module method
Existing Orders:	Waste Discharge Requirements, Order No. 01-112; Landfill Super Order 93-84

SUMMARY

The proposed Waste Discharge Requirements Order No. R3-2008-0050 ("Order" or "Order No. R3-2008-0050") for the Paso Robles Class III Landfill (Attachment 1) specify landfill design and operation modifications to protect water quality. The revisions proposed in Order No. R3-2008-0050 and Monitoring and Reporting Program (MRP) No. R3-2008-0050 (Attachment 2), are necessary to update the regulatory and operational status of the Paso Robles Class III Landfill (Landfill). The City of Paso Robles (City) owns the Landfill; it is operated by Pacific Waste Services, Inc. (PWS) under contract with the City. The proposed Order includes:

- a. Specifications for disposal of treated wood waste.
- b. Compliance review of the 80-acre landfill facility.
- c. Description of Landfill operations including waste management unit construction changes.
- d. Updated environmental monitoring information; provision requiring Discharger to address groundwater monitoring data gaps.

The proposed Order benefits and protects groundwater and surface water through required engineering controls, corrective action, and monitoring. To improve protection of groundwater, the proposed Order includes a provision for the Discharger to replace downgradient monitoring wells that have become dry as a result of declining water table.

DISCUSSION

The proposed Order updates and replaces Waste Discharge Requirements Order No. 01-112, adopted by the Water Board in October 2001. The proposed Order covers the current landfill operations and provides guidance and requirements for planned changes at the Landfill. For the lined portion of the facility, design and construction specifications within the proposed Order meet or exceed requirements in both the California Code of Regulations (CCR) Title 27, and 40 Code of Federal Regulations, Parts 257 and 258, both of which pertain to design of solid waste management facilities.

Since 2001, the Landfill has undergone a number of operational changes and environmental controls that include, in part, the following:

- Enhancement of the landfill gas recovery system via installation of new landfill gas recovery wells;
- Installation of new groundwater monitoring well and two new vapor monitoring probes;
- Improved stormwater monitoring program;
- Improved stormwater drainage to reduce the generation of leachate;
- Additional hydrogeologic investigations to define the location of perched groundwater;
- Incorporation of a household hazardous waste collection facility.

FACILITY DESCRIPTION: The Landfill is located approximately 32 miles inland from the Pacific Ocean, and within the southern and central portion of the Salinas River Valley (Figure 1 of Order No. R3-2008-0050). The Discharger opened the Landfill to the general public in 1970. On May 17, 1994 the Discharger adopted Resolution 94-81 that amended the Landfill's service area boundary to include all of San Luis Obispo County.

The Landfill's property boundary encompasses about 80-acres. The total area for existing or future "Waste Management Units" is about 65-acres (80-acres less a 50-foot setback from the Landfill's boundary plus acreage needed for other improvements such as roads, buildings, basins, etc.).

The Landfill's planned maximum elevation is 1,226 feet above mean sea level over the south Existing Refuse Fill Area, with a 5% grade on the top deck and a maximum horizontal to vertical ratio of 3 to 1 (Figure 4 of WDR No. R3-2008-0050) on the side slopes. The Landfill is expected to reach its full capacity by the year 2051. The Landfill accepts approximately 160 tons per day of waste. The City obtains soil from onsite borrow sources to cover waste.

From 1970 to 1993, the City utilized waste disposal operations utilized the trench method and the area-fill method of landfilling for disposal operations. In 1993, the Discharger began constructing and landfilling in 40 CFR compliant lined cells, starting with Module 1.

Landfill site infrastructure and ancillary facilities include a scale and scalehouse/office building, a paved and covered workshop, a permitted household hazardous waste drop-off facility (operated under separate permit issued to San Luis Obispo County), a landfill gas collection and flare system, water supply from an onsite water supply well, two (2) leachate storage tanks, and two (2) stormwater sediment retention basins.

Land use surrounding the Landfill is zoned for agriculture (vineyards, row crops, and grazing) and open space. Across Highway 46 opposite the Landfill are two wineries. An airport is located approximately five miles west of the Landfill.

GEOLOGY and HYDROGEOLOGY: The Landfill is located within the Upper Salinas River Basin, which is bounded to the northeast by the Diablo and Temblor ranges, to the south by the La Panza

Range, and to the west, by the Santa Lucia Range. The Landfill is located about 2,000-feet west-southwest of the Estrella River in an elevated area typified by small plains and rolling hills. The natural ground surface at the Waste Management Facility ranges in elevation from 990 to 1,120-feet above mean sea level.

The geology beneath the Landfill area is characterized by gently north to northwest-dipping Plio-Pleistocene age non-marine Paso Robles Formation overlying the Miocene to early Pliocene fine-grained sediments of the Pancho Rico Formation of marine origin. The Paso Robles Formation was deposited in alluvial fan, flood plain, and lake depositional environments and consists of relatively thin, generally discontinuous, weakly indurated sand and gravel layers interbedded with thicker layers of silt and clay. In the vicinity of the Landfill, the Paso Robles Formation is approximately 1,400-feet thick. Locally overlying the Paso Robles Formation (from 0 to 30 feet thick in thickness) is Quarternary age alluvium deposits consisting of unconsolidated gravel, sand and silt. Boring logs for onsite wells describe the lithology beneath the site as consisting of unconsolidated clayey sand to gravelly sand, sandy clay, and clay to a depth of 355 feet below ground surface.

The Landfill is located within the Paso Robles Subbasin of the Salinas Valley Groundwater Basin. The upper aquifer beneath the Landfill occurs in the Paso Robles Formation, with groundwater encountered at depths of between 250 and greater than 320 feet below ground surface (approximately 760 to 820 feet above mean sea level). Groundwater potentiometric surface maps indicate groundwater flows in a west to northwesterly direction at the Landfill site. Since 2005, the Discharger has not been able to collect samples from monitoring wells MW-3 and MW-8 because they have become dry due to falling groundwater levels.

First encountered groundwater beneath the Landfill occurs in discontinuous perched zones at approximately 75 to 180 feet below ground surface (approximately 920 to 930 feet above mean sea level). Investigations in 2002-2003 using down-well neutron probe along with drilling to install monitoring wells, including MW-11 in 2006, indicates that perched groundwater does not exist on the west side of the Landfill property boundary. The Discharger reports that the lateral extent of the perched groundwater is restricted to the eastern and southern boundaries of the Landfill facility property.

There are 13 water supply wells (primarily for agricultural and industrial use) and eight Landfill related groundwater monitoring wells located within a mile of the Landfill.

A 100-year Floodplain Map shows the Landfill is not within a 100-year floodplain. The Landfill is located about 2,000-feet west-southwest of the Estrella River (Figure 2 of the draft Order). Estrella River trends from the southeast to the northwest and is an intermittent flowing river. The Salinas River is located about eight miles to the west of the Landfill and intermittently flows from south to north.

CONTROL SYSTEMS AND MONITORING: The 65-acre permitted waste footprint of the Landfill is divided into several existing and proposed "Waste Management Units" or modules, which are defined in Table 1 below (and Figure 3 of WDR No. R3-2008-0050). The north and south existing refuse fill areas predate the requirement for a liner and consequently are unlined. Modules 1, 2A, 2B, 3A and proposed Modules 3B, 3C, 4 and 5 (when constructed) will include Title 27 and 40CFR compliant liners and leachate collection systems. The Discharger's proposed final grading plan calls for waste to be placed above existing modules, both lined and unlined, to achieve final grading contours.

TABLE 1: Paso Robles Class III Landfill Waste Unit Summary

Module	Acres	Design	Status
North-Existing Refuse Fill Area	4.7	Unlined	Interim Cover
South-Existing Refuse Fill Area	14.8	Unlined	Interim Cover
1	2.1	Lined/LCRS	Interim Cover/Used as Wet Weather Area
2A	3.2	Lined/LCRS	Interim Cover/Used as Wet Weather Area
2B	2.5	Lined/LCRS	Active Fill Area
3A	2.6	Lined/LCRS	Active Fill Area
3B	3.4	Lined/LCRS	Proposed
3C	3.2	Lined/LCRS	Proposed
4	19.3	Lined/LCRS	Proposed
5	12.7	Lined/LCRS	Proposed

Leachate captured by the liners flows by gravity to two aboveground leachate storage tanks, located immediately north of Module 2B and immediately northeast of Module 3B. Leachate collected in the leachate tanks is either hauled to the Discharger's wastewater treatment plant, or used for dust control and soil compaction over bottom-lined modules. Monitoring requirements for the leachate system are detailed in Monitoring and Reporting Program No. R3-2008-0050 (MRP No. R3-2008-0050).

Future modules will be designed and constructed to meet or exceed minimum standards established in Title 27, §20240 (c), (d), §20260, and §20310, 40 CFR 258.40 and 258.60 et al., and any additional requirements of this Water Board. Where there is a conflict between state and federal regulations, the most water quality protective regulation applies. For future module liner designs, the Executive Officer will evaluate engineered alternative designs on a module by module basis with respect to performance standards of the Prescriptive Design. Recent data suggests that geosynthetic clay liners may not perform as well as the Prescriptive Design in conditions of differential settlement, deformation, and percolation of leachate.

Landfill Gas: The Discharger installed and began operating a landfill gas recovery system in 1998. The Discharger enhanced the system in December 2003 by adding five vertical and 10 horizontal gas recovery wells, improving the landfill gas recovery rate from approximately 117 to 155 standard cubic feet per minute. The gas recovery system has successfully addressed downward migration of volatile organic carbon compounds (VOCs) from the southern unlined refuse fill area, as determined by VOCs detected in samples collected from adjacent lysimeters (discussed further below). Recovered landfill gas is burned in an onsite flare per San Luis Obispo Unified Air Pollution Control District requirements. Condensate from the gas system is handled the same way as leachate.

There are four sediment retention basins associated with the Landfill: two terminal basins that ultimately drain offsite, located along the west and east facility boundary, and two internal basins located on the east side of the facility, refer to (Figure 3 of the proposed Order).

COMPLIANCE HISTORY: To date, monitoring in accordance with the approved monitoring program indicates this Landfill has not caused a release to groundwater.

An April 29, 1996 letter from the Executive Officer directed the Discharger to:

- Submit a remedial action plan to address a VOC release to the vadose zone, as indicated by VOC concentrations detected in leachate from soil moisture monitoring probes (lysimeters), located on the southwest side (unlined refuse area) of the Landfill.

With the installation and startup of the landfill gas recovery system in 1998, and enhancements made in 2003, the Discharger appears to be successfully correcting the migration of VOCs, as indicated by the declining VOC trends illustrated in the graph below:

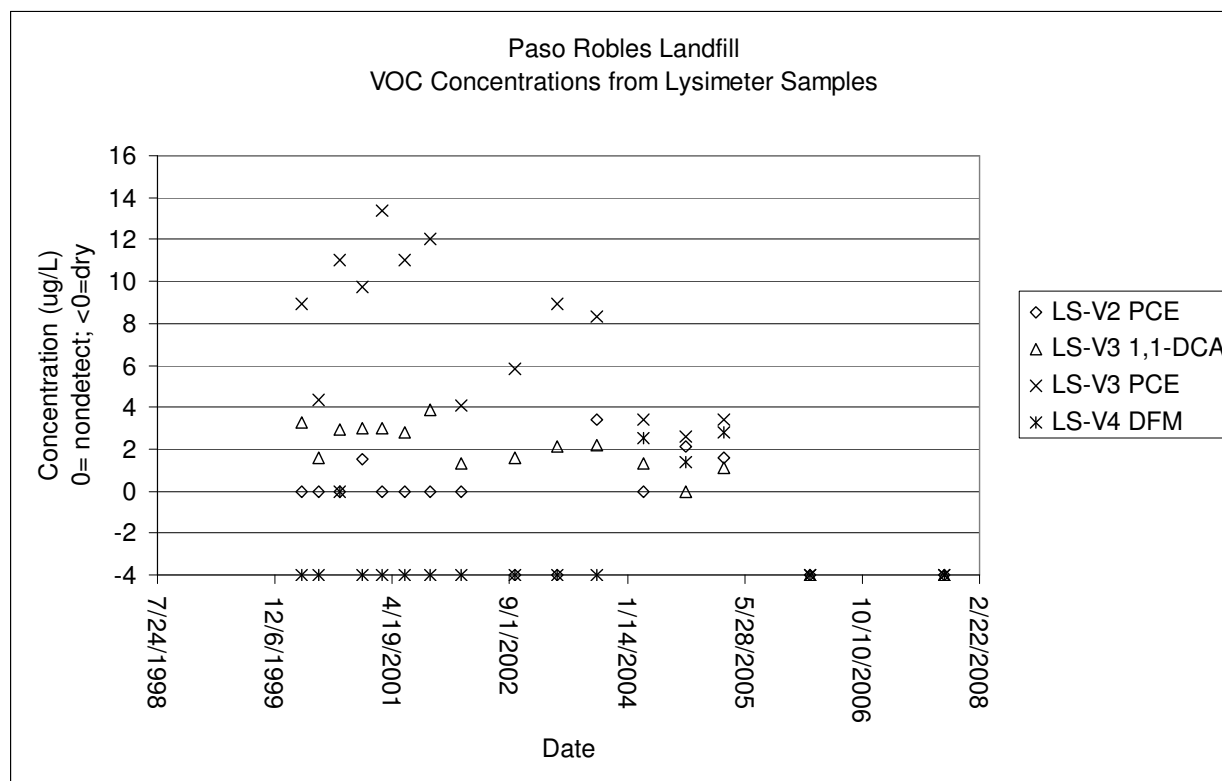


FIGURE 1. VOC concentration trends since 2000 from Landfill lysimeter monitoring points. LS-V2= Lysimeter Monitoring Point No. 2; PCE= perchloroethene; DCA= dichloroethane; DFM=Dichlorodifluoromethane

Note that the drinking water Maximum Contaminant Level (MCL) for PCE and 1,1-DCA is 5 µg/L and there is no MCL for dichlorodifluoromethane. Monitoring since 2005 indicates either dry conditions or soil moisture concentrations are below MCLs.

As discussed above, the upper aquifer is relatively deep below the Landfill, such that appropriate perched groundwater and vadose (unsaturated zone) monitoring are critical for early detection of a landfill release. In this regard, the Executive Officer sent a September 3, 1999 letter to the Discharger that included discussion of the following groundwater monitoring issue:

- Assess the vertical and lateral extent of perched groundwater beneath the Landfill. CCR Title 27 §20415 b.B.4 requires that perched groundwater be monitored in order to get the earliest possible detection of a release.

Since 1999, the Discharger has characterized the lateral and vertical extent of the perched zone during the installation of groundwater monitoring wells MW-V10, MW-8, MW-9, and MW-11 (MW-11 installed in 2006). In addition, the discharger conducted down-hole geophysical surveys (neutron log in addition to other techniques) to delineate the perched zone. The results of the investigations indicate that the perched zone is laterally discontinuous, and is restricted to the eastern and southern area of the Landfill.

In a letter dated February 10, 2003, the Discharger received a notice of violation relating to excessive erosion and offsite discharge of sediment from the Landfill's western haul road during an intense storm event. The Discharger reported that the erosion was caused by intense rainfall that may have exceeded the predicted 100-year return period design of the stormwater control system. The Discharger addressed the problem by clearing out accumulated debris from the drainages and directing flow off of the road to the stormwater retention basin. In addition, the Discharger installed sampling devices that automatically collect a sample from the first release from the sediment collection basins.

In a letter dated July 5, 2007, the Discharger received a notice of violation for failure to submit the Joint Technical Document and collect confirmation samples. MRP 01-112 requires that the Discharger notify the Executive Officer when groundwater sample results tentatively indicate a release from the Landfill and to collect groundwater samples; however the Discharger did not do either of these things. The Discharger addressed the violation with the collection of confirmation samples (original detection of PCE not confirmed) and submittal of the Joint Technical Document in August 2007.

MONITORING AND REPORTING PROGRAM (MRP)

The Landfill's current monitoring system includes:

- Eight groundwater monitoring points (wells MW-2, MW-3, MW-V4, MW-V5, MW-8, MW-9, MW-11, and MW-V10);
- Two stormwater monitoring points (western and eastern stormwater sediment basins);
- Six Lysimeters (LS-V1, -2, -3, -4, -5 and -6);
- Seven gas probes (GP-V1, -2, -3, -4, -5, -7, and -8)

Water Board staff amended MRP No. R3-2008-0050's Table 1 Monitoring Table of the prior MRP by removing the following parameters: Iron, chromium, lead, and zinc. These parameters are not typically good indicators of a landfill release to groundwater because their concentrations are not sufficiently elevated in leachate collected from the Landfill. Staff added total alkalinity because landfill gas or leachate can cause significant increases in concentrations of alkalinity in groundwater. Staff removed stormwater sampling parameters (e.g., total suspended solids, total organic carbon, etc.) from Table 1 but included them in new Table 4. Staff added or retained nickel, cadmium, zinc, and nitrate in the stormwater parameter list for the purpose of monitoring runoff from stockpiled waste metals and biosolids. Staff added organophosphorous pesticides and chlorinated herbicides to the constituents of concern list (monitored every five years) because of potential for their presence in Landfill wastes.

In 2006, Discharger installed groundwater monitoring well MW-11, and soil vapor probes GP-7 and GP-8, to assess proper repair of a torn bottom liner. The MRP now includes monitoring well MW-11.

CONCLUSION

To date, monitoring in accordance with the approved monitoring program indicates this Landfill has not caused a release to groundwater.

As the Landfill progresses toward its design capacity with expansion to the north, additional monitoring wells will likely be needed. Water Board staff will continue working with the Discharger to make sure the Landfill's groundwater monitoring program is adequate to measure potential contamination migration from the Landfill.

COMMENTS ON ORDER NO. R3-2008-0050**RECOMMENDATION**

Adopt proposed Waste Discharge Requirements Order No. R3-2008-0050.

ATTACHMENTS

1. Proposed Waste Discharge Requirements Order No. R3-2008-0050
2. Proposed Monitoring and Reporting Program No. R3-2008-0050
3. Comments Received on draft Order and MRP No. R3-2008-0050